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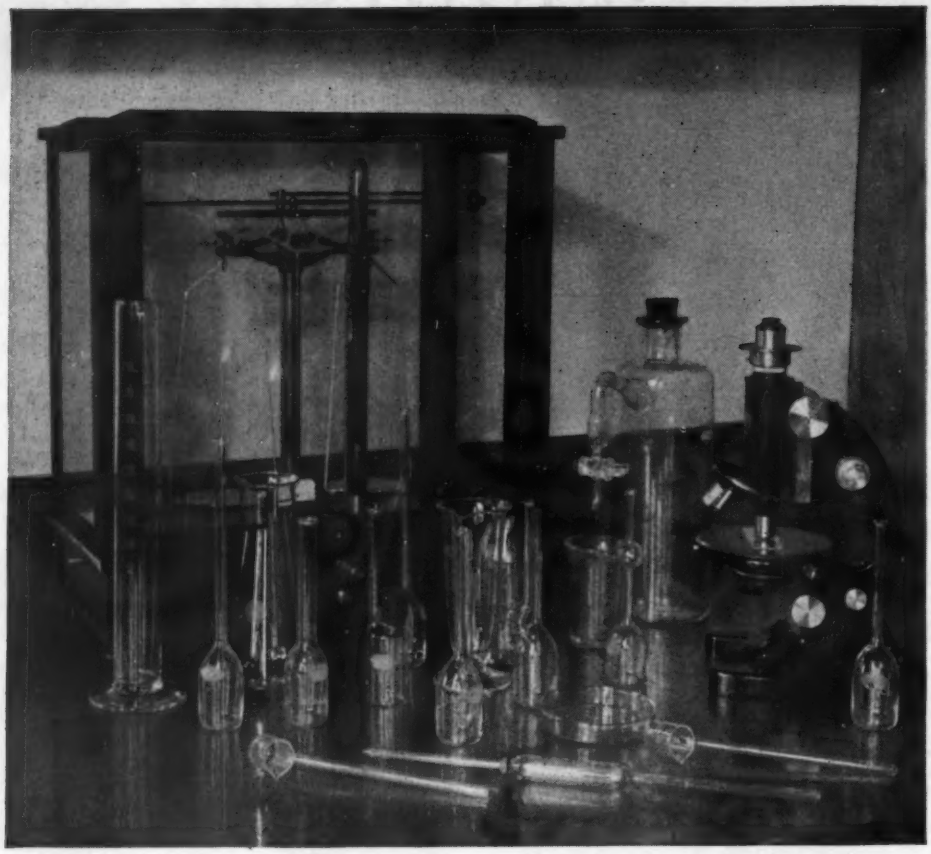

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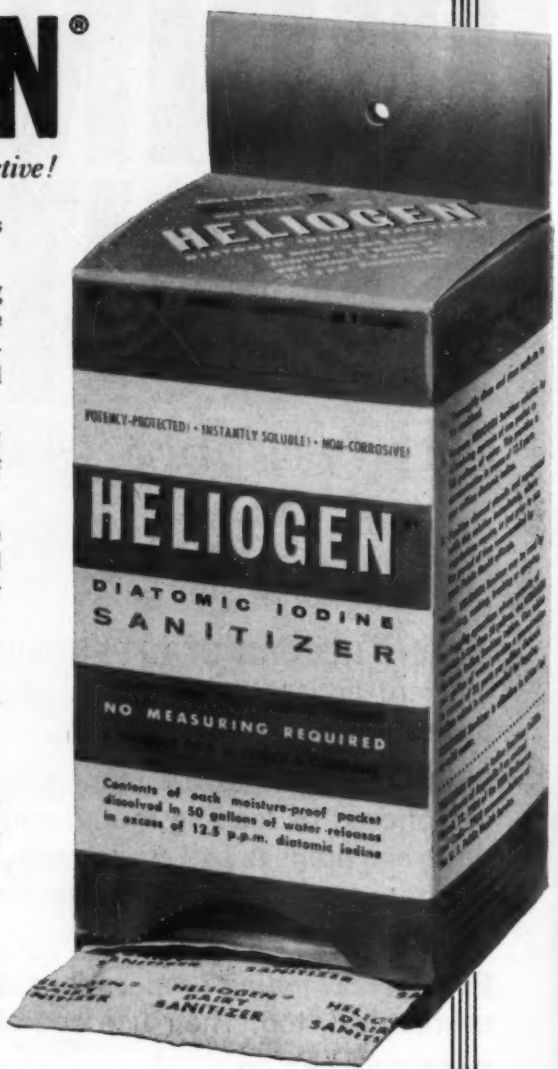
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THE RELATIONSHIP OF CERTAIN FACTORS EFFECTING HYDROLYTIC RANCIDITY IN MILK[1]

J. F. Speer, Jr., G. H. Watrous, Jr., and E. M. Kesler[2]

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(Received for publication November 9, 1957)

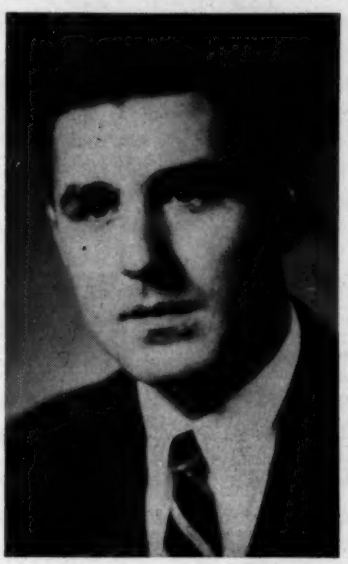
A survey of 39 stanchion and parlor pipeline milkers in Pennsylvania indicates a considerable amount of rancid milk being produced on many of these farms. The majority of farms having installations with vertical risers were encountering this difficulty. The effect of stage of lactation seems to be a more important factor on the susceptibility of milk fat to lipolysis than variations between summer and winter feeding.

With the advent of stanchion and parlor pipelines the incidence of hydrolytic rancity in fluid milk apparently has increased, with evidence that such equipment is responsible for the problem in the majority of instances. Numerous factors are known to influence the susceptibility of milk to induced rancidity in pipeline installations. Foremost among these are risers, vertical sections of pipelines connecting one pipeline to another at a higher level (*1, 2, 3*). Other factors which may be contributory include milk flow rate, excessive elbows in the circuit, air admitting claw plugs, vacuum releasing mechanisms, continuous operation of centrifugal pumps, and excessively long lines (*1, 2, 3*). Many of the preceeding factors have been eliminated by pipeline manufacturers in units where trouble has developed. Filtering devices placed on the pressure side of the installation and in a horizontal position have aided in reducing rancidity (*2*). In some instances, solid claw plugs substituted for the air admitting type have proved advantageous. To prevent continuous operation or "starving of the vacuum breaking pump, electronic probes have been installed, insuring a reservoir of milk and minimizing foam formation. The use of milk weighing or measuring jars in the barn, resulting in a large volume of milk entering the line at one time, has greatly reduced the air to milk ratio, and is thought to be of value in reducing foam formation (*2*).

Management factors also are important in controlling the development of rancid milk on the farm. Routine checking of the lines and connections for air leaks, minimizing air intake around teat cups during machine stripping and quick changing of milking units from cow to cow greatly reduce the possibility of induced rancidity in pipeline installations (*1, 2, 4*).

The present study was undertaken to ascertain the severity of the rancid milk problem on a group of representative farms in Pennsylvania. In addition, information was desired on the effects, if any, of certain feeding practices and stage of lactation of the animals as related to the susceptibility of the milk to lipolysis.

For portions of this investigation, a pipeline milker was furnished and installed at The Pennsylvania State University by The DeLaval Separator Company of Poughkeepsie, New York.



Mr. J. F. Speer, Jr. received the B.S. and M.S. degrees in Dairy Science from The Pennsylvania State University in 1955 and 1957, respectively. Mr. Speer is currently continuing his graduate studies as a candidate for a Ph.D. degree at Penn State.

[1]Authorized for publication on October 11, 1957, as paper No. 2203 in the Journal Series of the Pennsylvania Agricultural Experiment Station.

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TABLE 1 — SUMMARY OF DATA FROM FARMS WITH STANCHION PIPELINES

Farm Number	A.D.V. in June '56	A.D.V. in Jan. '57	Total feet of pipeline	Inches of "risers"	Probes[b]	Number of milkings represented June	Jan.
1	0.90	1.51[a]	458	67	No	2	4
2	0.81	0.90	220	....	Yes	4	2
3	1.05	1.38[a]	170	....	Yes	1	2
4	1.83[a]	1.49[a]	560	42	Yes	2	3
5	1.64[a]	1.88[a]	165	36	No	1	2
6	3.08[a]	3.37[a]	300	22	No	4	4
7	2.00[a]	2.72[a]	320	8	No	2	4
8	0.60	0.79	150	....	No	4	1
9	1.91[a]	1.58[a]	170	....	No	2	2
10	2.33[a]	2.20[a]	380	78	No	2	2
11	1.02	.....	200	....	Yes	4	..
12	2.57[a]	1.23	110	30[c]	No	2	2
13	1.20	.....	260	....	Yes	2	..
14	0.87	2.49[a]	265	34	Yes	2	2
15	5.38[a]	2.49[a]	270	8	Yes	3	4
16	1.28	0.79	48	20	Yes	2	2
17	0.80	1.14	48	18	Yes	2	2

[a]A.D.V. indicates level above the most frequent minimum level where rancid defects were noted organoleptically.

[b]Probes — Electronic device to start and stop pump in milk releaser.

[c]Risers eliminated previous to January sampling.

EXPERIMENTAL PROCEDURES AND RESULTS

Study Number I - Procedure

Working in conjunction with various county agents throughout Pennsylvania, a group of 39 stanchion and parlor pipeline installations was selected. These farms were visited in June, 1956, and observations were made on the physical installations. The data collected included the physical features of the system such as length of the pipeline, number of milking units, total height of risers if present, type of vacuum releasing device, position of milk filter, automatic pump controlling devices, and means of air admission into the milk line. Other information collected included the manufacturer of the unit, number of milking cows and breed, and the number of milkings represented in the milk sample collected.

Approximately one week subsequent to the original survey, the selected farms were revisited and milk samples collected. Immediately after collection, the samples were placed in an ice bath cooler and held for 24 hours before analysis. In order to detect any seasonal effect on fat hydrolysis, 37 of these farms were revisited and samples collected in January, 1957.

Samples were analyzed for free fatty acids by the method of Thomas *et al.* (*6*) with the following minor modifications: (a) 17.6 ml. milk pipettes were substituted for a graduated syringe; (b) nine-gram 20 per cent ice cream bottles were used rather than 18-gram eight per cent bottles; and (*c*) fat was removed with calibrated 1 ml. volumetric pipettes rather than a syringe, which required the substitution of the ice cream bottles for the milk test bottles. The actual weight of fat delivered by this method was determined. To insure delivery of constant weights, the pipette was rinsed with two 1-ml. portions of petroleum ether. Following this, the fat was dissolved in an additional 8 ml. of petroleum ether and titrated with 0.027*N* alcoholic KOH to the phenophthalein end point. Acid degree values were expressed in terms of ml. of *N* KOH required to neutralize the free fatty acids in 100 grams of fat.

Study Number I - Results

A summary of the data collected in the farm survey together with acid degree values (hereafter referred to as A.D.V.) of the milk samples is presented in Tables 1 and 2. Table 1 represents those installations having stanchion units, while Table 2 represents parlor-type units.

Preliminary observations indicated that an organoleptic criticism of rancid rarely was given unless the A.D.V. was 1.3 or higher. While this varied somewhat from sample to sample and especially with different judges, it was decided to use this value as the differentiating level between rancid and nonrancid.

An examination of Table 1 reveals that eight of the 17 milk samples collected in June from farms with stanchion units had an A.D.V. of 1.3 or higher, while the January results indicate 10 out of 15 on a similar basis. The increasing percentage of samples in the January survey with values above 1.3 perhaps indicates that winter produced milk is more susceptible to hydrolytic rancidity than that produced in summer.

The factor most commonly associated with rancidity was the presence of risers. While no apparent correlation seemed to exist between the height of the riser and the A.D.V's., in the June survey, seven out of 11 installations where risers were present showed A.D.V's. of 1.3 or higher. In January, eight out of 10 were in this category. One of the installations from which rancid milk was detected in the June survey eliminated the vertical risers before January, and the A.D.V. in January was satisfactory.

The data representing parlor milkers are presented in Table 2. An examination of the data shows that the A.D.V's. of the milk obtained where parlor milkers were used were lower, in general, than with the stanchion units. In the course of the survey relating to parlor milkers, only 11 out of 44 samples had A.D.V's. of 1.3 or higher. Where risers were present, five out of six samples of milk were rancid, whereas only six of the remaining 38 samples had values of 1.3 or higher. Again, the A.D.V's. obtained in January were higher, in general, than those found in June.

Study Number II - Procedure

In this study seven Holstein cows at varying stages within their lactation periods were milked using an experimental stanchion pipeline milker. This unit had the following physical dimensions: overall length 94.5 feet; one vertical riser 54 inches in height; a vacuum pump, and a vacuum releasing pump and milk collecting jar. As installed, the unit was similar to farm installations except for the addition of a loop to provide a riser in the system when desired. Milk samples were withdrawn from sampling cocks before and after the 54 inch riser.

The plan of this study was to determine the effect of varying feeding practices and the stage of lactation on the susceptibility of milk fat to lipolysis The cows at the beginning of the study had been in production from five to 128 days. The feeding variations were designed to note the effect of winter feeding practices as compared to summer feeding practices on the resistance of the milk fat to lipolysis. Beginning with April 12, 956, the animals were fed a winter ration, consisting of mixed hay, grass silage, and a grain mixture. On May 8, 1956, the animals were turned out to pasture. Following this on July 18, 1956, the seven test

TABLE 2 — SUMMARY OF DATA FROM FARMS WITH PARLOR PIPELINES

Farm Number	A.D.V. in June '56	A.D.V. in Jan. '57	Total feet of pipeline	Inches of "risers"	Probes[b]	Number of milkings represented June	Number of milkings represented Jan.
18	0.72	0.91	30	....	No	2	2
19	0.81	1.00	18	....	No	1	1
20	0.70	0.94	24	....	No	1	1
21	0.90	1.08	24	....	No	2	2
22	0.99	1.00	31	....	No	2	2
23	0.90	1.08	34	....	No	2	2
24	1.67[a]	0.67	24	....	No	2	1
25	1.17	1.32[a]	25	....	No	4	2
26	1.38[a]	1.44[a]	18	....	No	4	2
27	1.14	1.52[a]	28	....	No	2	2
28	0.99	1.05	30	....	No	2	2
29	1.14	1.23	26	....	No	4	4
30	0.99	0.94	23	....	No	4	2
31	0.72	0.88	15	....	No	2	2
32	0.84	0.79	30	....	No	4	1
33	1.61[a]	1.46[a]	15	9	Yes	2	2
34	0.81	1.11	19	....	No	1	3
35	1.14	1.44[a]	19	....	No	2	2
36	0.96	0.91	20	....	No	2	1
37	0.93	1.11	66	....	No	2	2
38	1.29	1.49[a]	42	20	No	1	2
39	2.42[a]	2.84[a]	40	54	Yes	2	2

[a]A.D.V. indicates level above the most frequent minimum level where rancid defects were noted organoleptically.

TABLE 3 — THE EFFECTS OF VARYING FEEDING PRACTICES AND STAGE OF LACATION ON THE ACID DEGREE VALUES OF MILK FROM SEVEN COWS, INCLUDING THE EFFECT OF ONE 54-INCH RISER IN THE PIPELINE INSTALLATION

	Cow Number													
	870		902		897		904		889		888		928	
	A.D.V.'s.		A.D.V.'s.		A.D.V.'s.		A.D.V.'s.		A.D.V.'s.		A.D.V.'s.		A.D.V.'s.	
	Before Riser	After Riser	Before Riser	After Riser	Before Riser	After Riser	Before Riser	After Riser	Before Riser	After Riser	Before Riser	After Riser	Before Riser	After Riser
	Days milked after parturition at beginning of study													
	51		46		95		107		49		128		5	
	Animals on winter feed, April 12, - May 7.													
Average	0.93	1.96	0.80	1.26	0.59	1.12	0.81	1.11	0.59	1.06	1.55	2.42	0.89	1.95
	Animals on pasture, May 8 - July 17													
Average	1.24	2.19	1.08	1.41	0.65	1.19	1.39	2.72	0.82	1.71	1.29	2.53	1.30	2.37
	Animals placed under simulated winter feeding practices, July 18 - Aug. 8													
Average	2.54	5.25	0.89	2.14	0.67	2.27	1.60	4.05	1.04	3.94	5.73	6.43	2.11	4.56
	Animals returned to pasture August 18 - October 8													
Average	1.66	3.57	1.28	3.38	1.39	3.34	3.44	4.41	1.04	4.36	5.08	6.31	1.86	4.04
	Animals on winter feed October 15 - November 17													
Average	2.24	5.01	1.58	2.19	Dry	Dry	Dry	Dry	1.93	4.16	Dry	Dry	1.97	3.00

animals were removed from pasture and fed a winter ration consisting of mixed hay and concentrates. No silage was fed. During this period, cows were permitted to exercise in a restricted lot free of green feed. After one month under this simulated winter feeding program the animals were returned to pasture. The final shift to barn feeding commenced on October 15, 1956 and continued for the duration of the study.

Individual samples of milk from each cow, both before and after the experimental riser, were collected on an average of four times each month throughout the investigation. The samples were cooled immediately in an ice bath and approximately one hour after collection were placed in a refrigerator maintained at 5°C. and were held for 24 hours before analysis for A.D.V's.

Study Number II — Results

It is difficult to attribute changes in A.D.V's. of the milk to changes in feeding practices, since the A.D.V's. of the milk varied so widely from day to day from the same animal. Not only was this true but also the A.D.V's. of milk from animal to animal showed great variability. It appears indisputable that regardless of the stage of lactation of the animals when the study began, or the feeding regime, A.D.V's. showed a tendency to be higher as lactation progressed. The susceptibility of the milk to induced rancidity when passed through a 54-inch riser showed variability, with the milk from some animals exhibiting more resistance from time to time than that of other animals. In any case, it is evident that the riser caused a pronounced, if variable, increase in A.D.V's. in practically every series of samples. The responses to varying feeding practices were indefinite, and may have been masked by the increase in A.D.V's apparently due to advancing lactation. Data from this study are presented in Table 3.

DISCUSSION

Tables 1 and 2 show clearly that the A.D.V.'s of the milks obtained from selected commercial herds were higher, in general, during the January collection than those collected in June, at which time the herds were on green pasture. The difference in A.D.V's. of the milks may be due to factors other than the change in feeding practices. For example, in Study Number II the change in feeding regimes had little, if any, effect on the A.D.V's. of the milk, while advancing lactation seemed to exert a pronounced influence on the values. In the farm survey, information on the stage of lactation of the animals was not collected.

Seemingly the greatest single factor contributing to rancidity in milk when pipelines are used is the pre-

sence of vertical risers in the vacuum line, although no correlation seemed to exist between the height of the riser and the A.D.V. of the milk. Other factors including type of vacuum releasing device, absence of automatic milk pump controlling devices, and means of air admission into the line have been known to contribute to fat lipolysis, but no correlation was found between these factors and the samples collected in this survey.

The variability in A.D.V's of milk obtained from seven cows is shown clearly in Study Number II. These variations not only existed from animal to animal but also from day to day with milk from the same animal. While the A.D.V's. of milk collected after the experimental riser in the pipelines were higher in all cases than the same milk prior to the riser, these increases did not seem to change proportionally with stage of lactation. As mentioned previously, the stage of lactation of the animals seemed to have pronounced influence on the increasing A.D.V's. as lactation increased. This factor appears to be more important than the feeding variations employed in affecting the A. D. V's. of the milk.

SUMMARY

A survey of farms with stanchion and parlor type milking units indicated considerable evidence of rancid milk being produced on many of these farms. The majority of farms having installations with vertical risers in the vacuum line were encountering difficulty with rancid milk. The frequency and magnitude of this problem was greater in January than in June. No correlation was found in this farm survey between rancid milk and presence or absence of vacuum breaking devices, manner of air admission into the vacuum line, and breed of cattle.

Variations in the resistance of the susceptibility of milk to lipolysis from trial animals was pronounced. This also was true with milk from the same cow day to day. The effect of stage of lactation on the susceptibility of milk to lipolysis showed this factor to be of more importance than variations between summer and winter feeding practices. Milk samples showed higher A.D.V's. as lactation increased.

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POULTRY PROCESSING SANITATION UNDER OFFICIAL PROGRAMS[1]

JOE W. ATKINSON, D.V.M.
Public Health Service
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Washington 25, D. C.

Section 3 of *Public Law 85-172*, the Poultry Products Inspection Act of August 28, 1957, states that it is the policy of Congress to provide for the inspection of poultry and products "to prevent the movement in interstate or foreign commerce or in a designated major consuming area of poultry products which are unwholesome, adulterated, or otherwise unfit for human food."

In Section 4, the definitions of "adulterated" and "unwholesome" are essentially the same as the definition of "adulterated" in the Federal Food, Drug, and Cosmetic Act. Section 4 (g) states that "The term 'unwholesome' means: ....(3) Processed, prepared, packed, or held under unsanitary conditions whereby a poultry carcass or parts thereof or any poultry product may have become contaminated with filth or whereby a poultry product may have been rendered injurious to health...."

Thus, it is clearly the policy of Congress that poultry and poultry products shall be processed, prepared, packed, and held under sanitary conditions. However, specific provisions for sanitation are not included in the Act. Authority in this regard is delegated to the Secretary of Agriculture by Section 7, which states that poultry processing plants subject to the Act "shall have such premises, facilities, and equipment, and be operated in accordance with such sanitary practices, as are required by regulations promulgated by the Secretary...."

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IMPORTANT CONSIDERATIONS

From the viewpoint of official health agencies and the consuming public, what are the important considerations involved in the development and enforcement of sanitation regulations for poultry processing? Of course, whether at the Federal, State, or local level, such regulations should definitely prohibit unsanitary conditions and require sanitary facilities and operations. They should be detailed and specific to the extent necessary in order to assure effective and uniform application in all plants.

Need for Uniformity

The need for uniformity was a major concern of industry representatives who advised and assisted in the development of the Public Health Service Poultry Ordinance, which is recommended for voluntary use by interested States and municipalities in their intrastate poultry hygiene programs. The industry officials insisted that the sanitation requirements be as detailed as practicable, so as to be uniformly understood by members of industry and by health

[1]Prepared in connection with a panel discussion, "The New Federal Poultry Products Inspection Act," Conference of Public Health Veterinarians, Cleveland, Ohio, November 13-14, 1957.

personnel, and uniformly applied in all jurisdictions.

Uniformity between the new USDA sanitary requirements and those adopted by State and local agencies utilizing the PHS recommendations would help prevent administrative difficulties and possible misunderstandings. The PHS Ordinance was developed with the assistance and advice of a Public Health-Poultry Industry Liaison Committee, of State and local official agencies, of numerous health and professional organizations, and of the interested Federal agencies (*1, 6*). There would seem to be considerable merit in having the USDA regulations identical with the recommendations of the Ordinance, where the intent is the same.

Preventing Direct Contamination

In addition to the application of usual food sanitation requirements, it is apparent that special attention should be directed in poultry processing establishments toward conditions which can be directly observed as contaminating the product. Some of these conditions can be completely avoided. Included in this category are the conditions associated with the holding of New York dressed (uneviscerated) carcasses for delayed evisceration.

Another category includes the conditions of speed or carelessness which result in visible contamination of the edible product during and subsequent to evisceration. The possibility of such an occurrence is continuously present, and cannot be completely avoided. All too frequently in the past, adequate preventive measures have not been taken. To effectively prevent such contamination, it is obvious that standards of sanitary performance, directly enforceable by official inspectors, should be established.

The poultry processor has the responsibility for maintaining sanitary conditions throughout all processing operations, thereby preventing all unnecessary contamination of product, and for producing eviscerated poultry which is in fact ready to cook, either in the plant, or in the home or commercial kitchen. Under an official poultry inspection program, the inspecting agency has the responsibility of assuring that all products carrying the official legend for wholesomeness have been so processed.

NEW YORK DRESSED POULTRY

Aside from the question of adequate inspection for wholesomeness, the holding of poultry carcasses for delayed evisceration should be prohibited for reasons of sanitation. In fact, the conditions commonly associated with the handling of New York dressed poultry pending evisceration are among the most unsanitary to be found in any food industry, and provide unexcelled opportunity for mass contamination of food with feces and other wastes (*2*).

In testimony (*5*) given on behalf of the Conference of Public Health Veterinarians before the Subcommittee on Poultry and Eggs of the House Committee on Agriculture in March 1957, Dr. Max Hibbard reviewed the history of New York dressed poultry. He described the extremely unsanitary conditions involved, and pointed out that it is now practicable to prohibit delayed evisceration of poultry because a vast majority of present-day poultry processing plants have eviscerating facilities and equipment.

Warm Evisceration Necessary

The Manual For the Examination and Evaluation of Poultry and Poultry Products, distributed recently by the Food and Drug Administration, points out the necessity for warm evisceration of poultry because of both sanitation and inspection-for-wholesomeness factors:

"Therefore, for most effective consideration and evaluation of disease conditions in poultry, both ante-mortem and post-mortem inspection are necessary. Furthermore, evisceration and post-mortem inspection should follow immediately after slaughter and removal of the feathers, for the following reasons:

(a) To permit correlation of ante-mortem and post-mortem findings, and the conduct of any human or animal disease control measures indicated.

(b) The chilling in cracked ice, in ice slush or water, packing or shipping in cracked ice, or the freezing and defrosting of New York dressed poultry as commonly practiced, results in contamination of the carcass with filth - e.g., fecal material and exudates from the sinuses of the head and from the respiratory system. The contamination may extend into the lungs, and possibly into the air sacs, in the case of water or ice slush chilling.

(c) These same practices are likewise conducive to cross-contamination of carcasses with organisms from diseased or carrier birds which have not been eliminated on ante-mortem inspection.

(d) The changes which may occur in the appearance or consistency of organs or tissues with the passage of time, or as a result of chilling or freezing, may prevent adequate post-mortem evaluation under the usual conditions of post-mortem inspection."

Temporary Exemptions

Section 9 (i) of the Poultry Products Inspection Act authorizes "Delivering, receiving, transporting, selling, or offering for sale or transport for human consumption" uneviscerated poultry carcasses only "as may be authorized by and pursuant to rules and regulations prescribed by the Secretary (of Agriculture)."

In the House of Representatives Conference Report No. 1170, the Statement of Managers on the Part of the House pointed out that Section 9 (i) was modified:

"to permit the Secretary to grant some extension of time to processors of 'New York dressed' poultry to comply with the provisions of the act. The effective date of the the act with respect to its compulsory features is January 1, 1959. In view of the time which has elapsed since introduction and committee consideration of the bills the conference committee felt that some extension of this time might be needed by some processors of 'New York dressed' poultry to permit the changeover of their plant and operations to the processing of eviscerated poultry. The amendment to the House language will permit the Secretary to grant such extension 'pursuant to rules and regulations prescribed' by him. It is, however, the intent of the bill that the prohibition against 'New York dressed' poultry be made fully effective as soon as practicable."

The above statement indicates that, under the Federal act, exceptions should be made to allow the production of "New York dressed" poultry in plants which do not have eviscerating facilities and equipment, but that such exceptions should continue only for a reasonable period of time to permit a changeover in such plants to include eviscerating operations. The same principle could be followed by State and local agencies where such plants still exist under intrastate control programs.

Consumer Versus Commercial Convenience

It is true that there may be some economic advantage to the processor in certain conditions in which he would prefer to operate the killing line faster than the evisceration line, or perhaps perform killing and eviscerating intermittently. But this economic advantage is offset by a disadvantage to the consumer through exposure of the carcass to contamination and loss of assurance as to its wholesomeness. Commercial convenience should not have priority over health and consumer interests.

In consideration of the above, it is apparent that:

1. Warm evisceration should be required for all poultry processed in plants having eviscerating facilities.

2. Poultry from plants which do not have eviscerating facilities should not carry an official inspection-for-wholesomeness legend, even if eviscerated or further processed before retail sale. Such plants should be allowed only a reasonable period of time to make the changeover to the production of eviscerated poultry.

3. State and local jurisdictions should prohibit the evisceration of New York dressed poultry in retail markets or restaurant or hotel kitchens, thus preventing contamination of equipment and other foods in such retail establishments.

PROCESSING STANDARDS

Numerous helpful sanitation standards have been developed in the milk and food processing industries. Various facility, equipment, and microbiological standards have proven helpful to the industries and regulatory agencies concerned in maintaining high sanitary quality of products.

With respect to poultry products, several agencies and professional organizations have expressed interest in the development of microbiological standards. Some research has been conducted and more is planned, particularly with regard to precooked frozen poultry products. If developed, such microbiological standards should be quite beneficial. Nevertheless, results from microbiological examination of product samples are obtained days after actual processing. In the meantime, substantial quantities of product might be processed under conditions resulting in gross contamination. Moreover, regulatory agencies usually have limited resources, and laboratory examination of products must be conducted on an infrequent schedule, and on extremely limited samples.

Performance Standards Needed

Therefore, sanitary performance standards for poultry processing should be established, and should be continuously enforced, on the spot, by official inspection personnel.

For example, during evisceration, each poultry carcass is handled as a separate unit, and may be contaminated with feces or other wastes. Contamination from one carcass may be transferred to several succeeding carcasses.

Gunderson and co-workers (*4*), and Walker and Ayres (*7*)found that dressed poultry carcasses are relatively quite clean immediately after proper scalding, defeathering, and thorough washing. During evisceration, however, bacterial counts on the carcasses increase significantly as a result of contamination during handling incident to the various evisceration procedures. A chief source of such contamination, of course, is the intestinal contents of the carcasses (also a chief source of infectious organisms such as the Salmonella). Other important sources may be the crops or lungs. Such contamination can be prevented only through care in removing these organs so as to preclude incision or rupture.

Furthermore, if, after the final washing operation, an eviscerated carcass is not visibly clean or if it is contaminated by further handling to remove pieces of crop, trachea, lungs, or other inedible parts, it can

serve to contaminate other carcasses during chilling, or during subsequent cutting-up or packing operations.

Evisceration Standards

It seems logical that standards could be established and applied so as to routinely maintain sanitary conditions in these two instances. Specifically, a standard could be established that if more than a certain percentage of carcasses (for example, more than one in 100, thus allowing for true accidents) were being contaminated with crop material or feces as a result of incision or rupture of the crop or intestines during evisceration, the eviscerating operation would be immediately slowed down to the point where the performance standard could be met. Likewise, if more than a certain percentage of eviscerated carcasses were to be visibly unclean or require further removal of inedible parts after the final wash, the operation could be immediately slowed down to allow employees sufficient time to properly prepare the birds ahead of the final washing operation.

Undoubtedly, after appropriate consideration, comparable performance standards could be established at other points in the processing operations.

READY-TO-COOK POULTRY

The absolute necessity for careful, thorough cleanliness in the processing of poultry can be realized when we consider that eviscerated poultry as processed today is actually represented and accepted as ready-to-cook poultry. Therefore, it is, in effect, represented and accepted as clean enough to eat, since whatever is cooked is intended to be eaten. The fact that cooking may render unclean or otherwise unfit poultry safe to eat certainly does not render it fit to eat, whether cooked in the processing plant, the restaurant, or the home.

Modern housewives and chefs have come to expect truly ready-to-cook foods. Some may even go too far in this regard, as, for example, the housewife who put a frozen turkey in the oven to bake with the wrapped giblets still inside. However, there have been instances, in an apparently first class restaurant, where a half fried chicken with the entire leg and thigh badly bruised and discolored was served; and where a gizzard was served with a short piece of intestine and contents still attached. This illustrates that when people think they have paid for processing necessary to prepare ready-to-cook poultry, they expect to receive that kind of product, and act accordingly.

If fecal matter gets on the incised tissues of a carcass during evisceration, it may be washed off so as not to be visible, but some will remain (3). In fact, the washing operation serves to dilute and distribute a part of the soil over and into the tissues, while removing the remainder. Who would knowingly choose to buy and eat such poultry, even though the contamination is invisible and is cooked? Similarly, who wants to eat feathers or pinfeathers, even if cooked to a crisp. Eviscerated poultry should be in fact ready to cook without need for further cleaning, trimming, or washing.

Poultry processors have a responsibility to produce clean food under clean conditions. Cleanliness should not be sacrificed to speed or economy. To an even greater degree, under an inspection program, regulatory officials have a responsibility to make certain that cleanliness is maintained throughout poultry processing operations, and that truly clean, wholesome, ready-to-cook poultry is prepared when an official inspection-for-wholesomeness legend is to appear on the product.

SUMMARY

The Poultry Products Inspection Act places on the U.S. Department of Agriculture the responsibility of developing and enforcing regulations which will assure sanitation during all stages of poultry processing and result in eviscerated poultry which is ready to cook without need of further trimming or cleaning. State and local agencies conducting poultry hygiene programs for intrastate plants have a similar responsibility. To effectively accomplish this objective, regulations should be specific and detailed to the extent necessary for uniform application. To maintain uniformity with State and local requirements for intrastate plants based on the recommended PHS poultry ordinance, thus precluding administrative misunderstandings, it would be desirable for the USDA sanitation regulations to be as nearly identical as practicable to the sanitary requirements contained in the PHS ordinance. Warm evisceration should be required for all poultry which is to carry any official inspection-for-wholesomeness legend. The handling of New York dressed poultry should be restricted to those plants currently without eviscerating facilities under temporary exemptions granted only for such reasonable period of time as may be necessary to allow the changeover to the production of eviscerated poultry. Sanitary performance standards should be established for continuous, on-the-spot enforcement by inspection personnel, so as to maintain processing operations at such speeds and under

such conditions as to reduce contamination of product during evisceration and subsequent handling to that caused by true accidents.

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FOOD SANITATION AT THE 1957 NATIONAL BOY SCOUT JAMBOREE[1]

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"The Big Cook-Out", the largest out-door cooking operation in the history of scouting, took place at Valley Forge Park, Pennsylvania, July 12-18, 1957, at the Fourth National Boy Scout Jamboree. Fifty three thousand Boy Scouts and Scout Leaders representing every State and Territory of the United States, together with Boy Scout Contingents from several foreign countries, participated in this great 7-day encampment.

JAMBOREE PLANNING

Planning was started by the headquarters staff of the Boy Scouts of America more than two years in advance of the arrival of scouts at Valley Forge. The task of providing all necessary utilities, including electric lights, communications, housing, water supply, sewage disposal facilities, food service factilities, refuse collection and disposal, and health protection services for a community of over 53,000 scouts and leaders, plus thousands of daily visitors was a major undertaking and required careful and detailed planning by all departments of the Boy Scouts of America, working in close cooperation with Federal, State, and local agencies. For example, a water distribution system had to be designed and constructed which would provide an average of 1,000,000 gallons of safe water daily; electric and communication systems installed throughout the 2,000 acre camp-site; an amphitheater seating 55,000 persons constructed; adequate toilet factilities provided for both campers and visitors; enormous volumes of food and beverages of safe, wholesome quality obtained; food preparation facilities installed; and medical and sanitation services organized to handle all medical care and sanitation problems from the time the scouts left their homes until they returned.

Mr. Freeman received the B.S. degree in Civil Engineering from North Carolina State College in 1930 and the M.S. degree in 1932. He served with the North Carolina State Board of Health from 1932 to 1939, when he accepted appointment with the Public Health Service. His assignments with the Public Health Service have included two years duty on the Ohio River Pollution Survey, twelve years as Regional Milk and Food Consultant in the San Francisco Regional Office and four years in a similar official capacity in the New York Regional Office. He served as Chief Sanitation Officer for the 1953 and 1957 National Boy Scout Jamborees and for the U.S. Contingent at the 1957 World Jamboree in England.

As in each of the previous National Jamborees, the Boy Scouts of America requested the Public Health Service to assist with the planning and organizing for the medical and sanitation phases of the Jamboree. This activity included the sanitary supervision of all public conveyances, trains, planes, and buses used in transporting scouts to and from the Jamboree and on sight-seeing tours; inspection and laboratory control of all perishable food supplies, such as milk, milk products, frozen desserts, fresh meats and poultry, bakery products, fresh vegetables, and box lunches; assisting in determining the number and types of

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[1]Presented at the 44th ANNUAL MEETING OF THE INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. at Louisville, Kentucky, October 7-10, 1957.

[2]Regional Milk and Food Consultant, Regions I and II, U.S. Department of Health, Education, and Welfare.

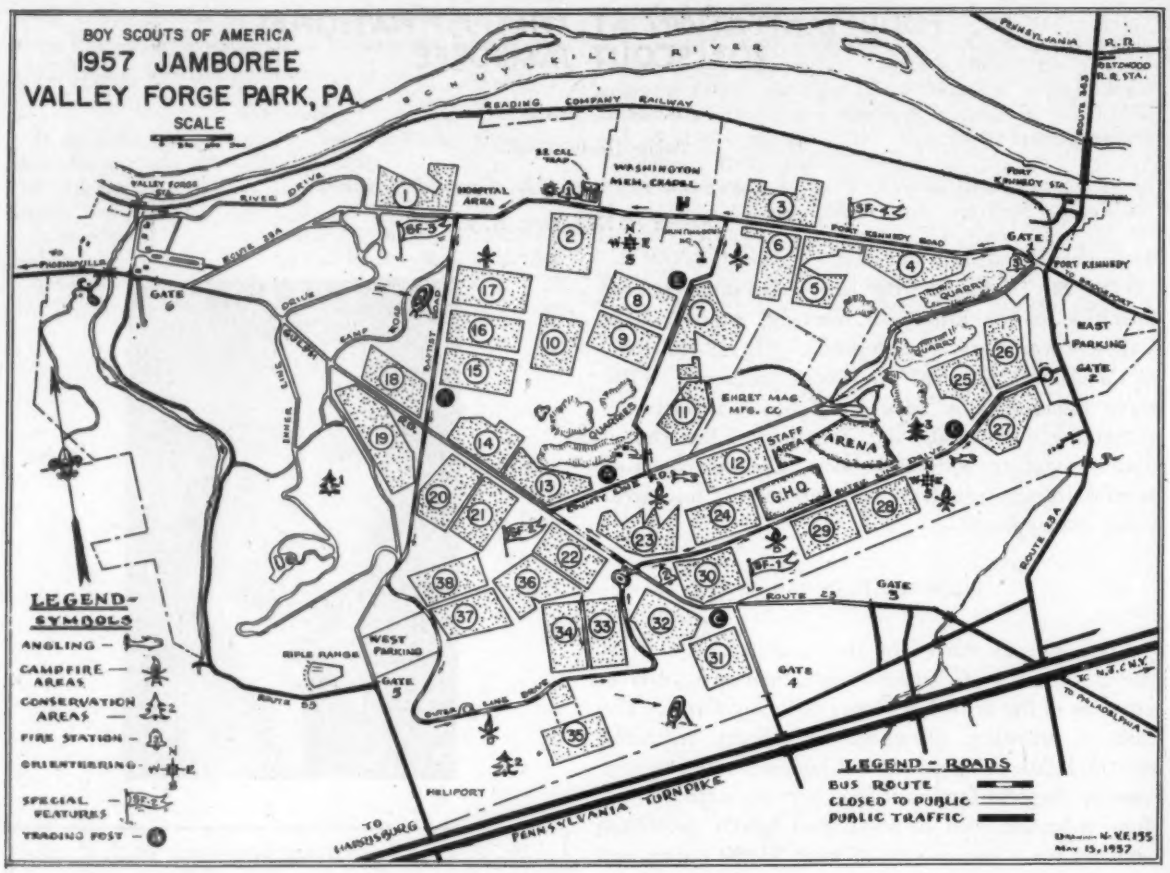

FIGURE 1. JAMBOREE CAMP LAYOUT

toilet factilities needed and properly locating these facilities; checking plans for the water and waste disposal systems; chlorine disinfection of the water distribution systems and maintaining a chlorine residual during the Jamboree; and planning for a complete environmental sanitation program for the Jamboree and fringe areas.

The basic plan as developed by the Engineering Service of the Boy Scouts of America included a General Headquarters area containing the various administrative offices, a field hospital, five Trading Posts, and 38 Section camps. Each Section was planned to accomodate 35 Boy Scout Troops, with 40 scouts and leaders in each Troop. The plan also provided for each Section to have administrative, commissary, and equipment supply tents, and a health lodge.

The responsibility for the planning and operation of food service facilities on the grounds was divided between the Commissary and Supply Service Departments of the Boy Scouts of America. The Commissary Department was responsible for: (*a*) obtaining all foods and beverages supplied scout units; (*b*) supervising the distribution of foods; (*c*) preparing menus and supervising food preparation by scout units; (*b*) contracting for the General Headquarters food service facility; (*e*) planning and supplying food service facilities for the 38 Section Administrative Staffs; (*f*) obtaining and distributing all single-service paper goods and cooking fuel; and (*g*) supplying box lunches to scouts taking the Philadelphia excursion trip. The Supply Service Department had the responsibility for planning, installation and operation of the five Trading Posts and the five Trading Posts' Staff Messes, including the purchase of all foods and beverages used or sold at these establishments. There were about 350 scout personnel on duty at the five Trading Posts.

During the early sanitation planning conferences, it was agreed that the Chief Commissary Officer and

Trading Posts officials would prepare lists of proposed food and beverage sources, such as milk, milk products, frozen desserts, fresh meats and poultry, etc. for use by the Public Health Service in arranging for sanitary inspections of these sources. All perishable food and drink sources would be screened for reasonable compliance with sanitation requirements before contracts were signed and a routine program of sanitary inspection and laboratory control provided for the sources awarded contracts. It was also agreed that the bids would specify that the facilities and methods used in processing food and drink, including the handling and storage of these products, must comply with the sanitation requirements established by the Public Health Service prior to the delivery of such products.

INSPECTION AND LABORATORY CONTROL OF FOOD SOURCES

The program of screening the proposed food and drink suppliers for compliance with sanitation requirements and conducting routine sanitary inspections of those suppliers awarded contracts was carried out in accordance with the agreements made during the planning conferences. This program was carried on as a joint activity with State and local health agencies.

The contracts for foods and beverages were completed early in May, which provided about two months for plant operators to make such sanitary improvements as were found necessary. All plant operators were furnished inspection reports listing items of sanitation requiring correction. For example, extensive sanitary improvements were necessary at vegetable packing plants, including the installation of spray washers to insure that the fresh vegetables would be washed in clean water and prepared so as to be safe for consumption by scouts without further cleaning at camp.

All milk and frozen desserts plant operators cooperated fully in bringing their plants up to the required sanitation standard. The milk companies also did a highly satisfactory job in delivering milk, milk products, frozen desserts, and fresh fruit juice properly refrigerated and in good condition during

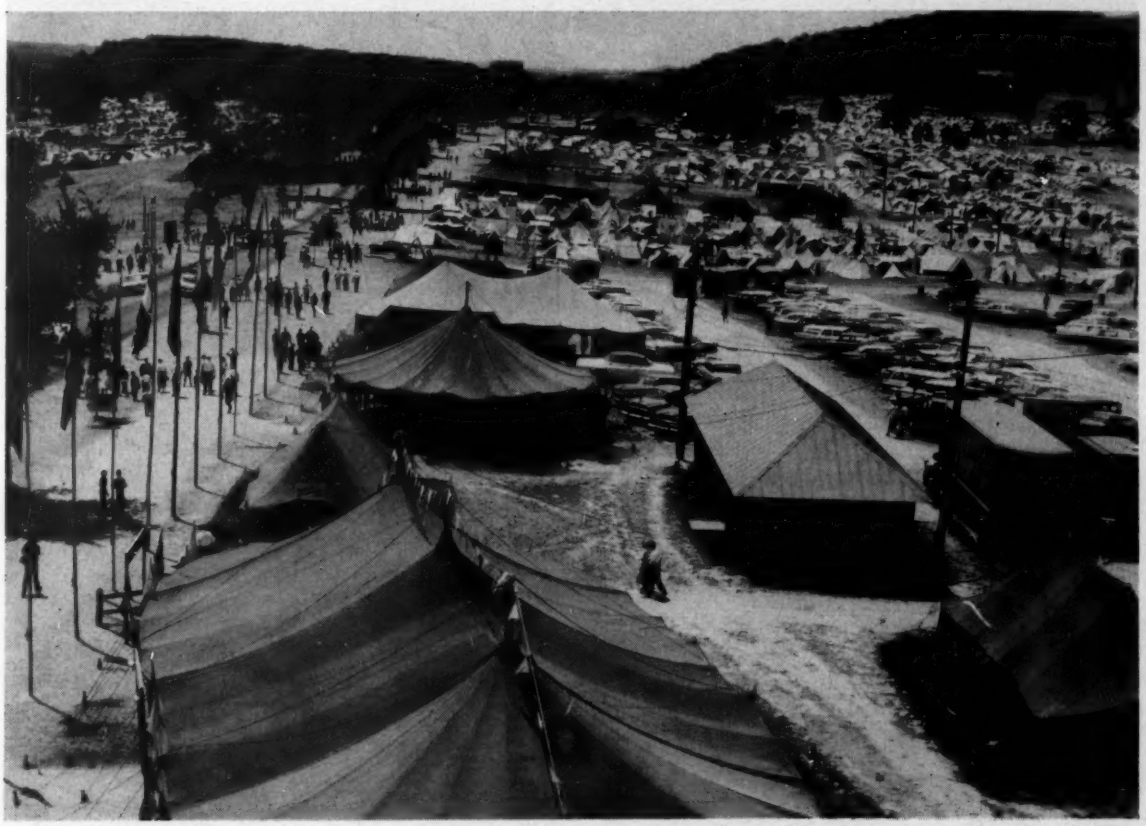

FIGURE 2. GENERAL HEADQUARTERS AREA

the entire period of the encampment. This is indicated by the fact that not a single complaint was received concerning the quality or condition of these products. The results of bacteriological analyses of these products daily by the Philadelphia City Health Department also showed that they were of safe sanitary quality. There were 27 composite raw-milk-for-pasteurization samples, 28 pasteurized milk samples, 29 frozen desserts sample, and 18 samples of fresh fruit juice collected and analyzed specifically for the Jamboree.

Excellent cooperation was likewise obtained from the management of other food suppliers, including the box lunch company which provided all necessary facilities and equipment to effectively safeguard the box lunches from the time they were prepared until distributed to scouts while on special tours. The ice supplier purchased new crushing and packaging equipment so that ice used in contact with food and

FIGURE 3. DISTRIBUTION OF MILK FROM REFRIGERATOR AT SECTION COMMISSARY

FIGURE 4. PATROL COOKING FACILITIES

drink would be handled in a sanitary manner. Ice was packaged in single-service containers and distributed from special ice refrigerators located in each of the five Trading Posts.

FOOD SERVICE FACILITIES

Each of the 38 Section Commissaries was provided with facilities for storing and distributing all food items, including three walk-in type electric refrigerators for the storage of perishable foods. One refrigerator was designated for milk and milk products, one for meats, fish and poultry, and one for fresh vegetables. Similar refrigeration facilities were also provided for the General Headquarters Mess, the Field Hospital Mess, the five Trading Posts and the five Trading Posts' Staff Messes.

All foods were delivered to the Section Commissaries and other food service operations at specified times daily, either from 12:00 *Midnight* to 2:00 *a.m.* or from 5:00 *a.m.* to 7:00 *a.m.* Perishable food items were delivered in refrigerated trucks and placed directly into the camp refrigerators. These perishable foods such as milk, butter, fresh meats, and fresh vegetables were distributed to the Scout Troops just before each meal, while other food items like canned foods, bread, and cereals were distributed once each day.

The scouts prepared their food on charcoal stoves on a patrol basis, 10 scouts to a patrol and four patrols to a Troop. The commissary supplied charcoal packaged in 10-lb. bags for cooking operations. It was learned during the 1953 National Jamboree that one 10-lb. bag of charcoal per patrol per day was more than adequate for the preparation of three meals. There were over 5,000 separate patrol cooking operations going on simultaneously using the same food items and menu. One can readily imagine what a tempting aroma arose over the 2,000 acre camp-site the night 53,000 charcoal steaks were cooked.

The General Headquarters Food Service was operated by a caterer on a cafeteria style. This establishment was well equipped with all new food preparation equipment, including gas range, hot water system, and complete dishwashing facilities.

As in the case of scout food service operations, single-service plates, cups, etc. were used. Therefore, dishwashing was limited to eating utensils and food preparation utensils and equipment. The methods of food preparation and the quality of foods served were exceptionally good for this type of out-door operation.

Food service operations at the five Trading Posts consisted of the preparation and serving of hamburgers, franks, and coffee. Milk and chocolate drink were served from approved refrigerated bulk milk dispensers, and only packaged ice cream novelties were sold. Each Trading Post was provided with three fountain-type soft drink stands. Carbonated and non-carbonated beverages were served at these stands in paper cups, which eliminated the glass bottle hazard of previous Jamborees.

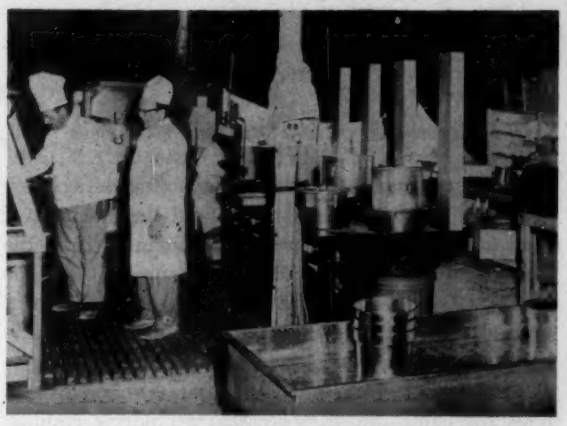

FIGURE 5. GENERAL HEADQUARTERS STAFF KITCHEN

The magnitude of the food service operations is indicated to some degree by the following quantities of foods and beverages consumed:

598,000	Quarts of Milk
23,000	Quarts of Ice Cream
264,000	Ice Cream Novelties
42,000	Pounds of Butter
47,000	Dozens of Eggs
102,000	Quarts of Fresh Fruit Juice
107,000	Pounds of Fresh Meats, Hamburger, Steaks, etc.
20,000	Pounds of Chicken
132,000	Loaves of Bread

FIGURE 6. SERVING MILK AND CHOCOLATE DRINK IN TRADING POSTS

53,000 Box Lunches
Over 1,000,000 Carbonated and Non-carbonated Beverages

WATER SUPPLY AND WASHING FACILITIES

The water supply for all uses, including the cooking and serving of foods and drink and the washing of food utensils and equipment, was obtained from the Philadelphia Suburban Water Company. Sixteen separate water systems were installed in the area, with all new galvanized iron pipe being used. The water company agreed to increase the chlorine dosage at the Water Treatment Plant, located about 3 miles from the camp-site, in order that a chlorine residual of .2 to .3 ppm could be maintained. This provided a factor of safety in transporting water from the water drawing stations to the individual Troop sites. Each Section was provided with two water drawing stations and an 18-head shower building. Each Troop was also furnished two Lister bags and four 5-gallon G.I. water carrying cans. One Lister bag was designated for storage of drinking and cooking water, and the other installed near the Troop latrine for washing purposes.

The water distribution systems were given chlorine disinfection before they were placed in operation. The Lister bags and water carrying cans were also given chlorine bactericidal treatment at the time they were placed in use by the scouts. Chlorine residuals were checked daily by the Jamboree Sanitation Staff at designated sampling points throughout the Jamboree camp-site. Samples for bacteriological analyses were collected daily both from the water distribution systems and from a representative number of Lister bags. The results of the sampling program showed that the water was of safe, sanitary quality at all times.

SEWAGE AND WASTE WATER DISPOSAL

A two-seat pit latrine and urinal was provided each Troop. The pits were constructed by drilling three holes 12 inches in diameter and 6 feet in depth. A fly-tight privy box, with hinged lids, was mounted over two of the drilled holes and a funnel-type metal urinal installed over the third hole. A suitable deodorizer solution for treating the urinal and a bactericidal solution for use on toilet seats was supplied to the scout units.

There were 110 chemical toilets provided to serve the Trading Posts, General Headquarters Area, The Field Hospital, and other designated points for use

FIGURE 7. WATER DRAWING STATION

FIGURE 8. DRINKING WATER FACILITY IN TROOP SITE

by visitors. These chemical toilets were serviced daily by tank truck and maintained in a highly satisfactory sanitary condition. Latrines with long metal trough urinals were also constructed at Trading Posts and at other points where there were large concentrations of scouts and visitors.

INSECT AND RODENT CONTROL

One of the outstanding accomplishments of the Sanitation Staff was the effective control of flies, mosquitoes, and rodents. The control of flies is important to the success of any food operation and becomes of major importance in the case of a large out-door cooking operation, where screening is not available. A Public Health Service Jeep power spray unit was provided for treating all possible breeding places for flies and mosquitoes. This insecticide spray unit, equipped with a 150 foot ¾ inch rubber hose attached to a spray nozzle gun, proved to be excellent for insect control operations; however, forty hand spray cans were provided for use by Section Inspectors when needed.

Inspection activities during the early part of June showed that the fly population was low and that breeding sources were numerous but small. Likewise, there were no large breeding places discovered in the immediate fringe areas. Due to the excellent sanitation standards maintained, there was no fly breeding discovered in the camp-site during the entire period. However, some flies were drawn into the Jamboree area from the surrounding suburban areas. These flies, which concentrated in and around the Trading Posts, the General Headquarters Mess, and the Army Field Hospital Mess, were readily brought under control by the installation of a commercially produced fly cord in all areas where flies were reported or observed. Excellent fly control was obtained with this red colored, cotton fly cord, which contained 13.79% Parathion and 3.54% Diazinon by weight. Only a very small amount of supplemental spraying with Chlordane was necessary for fly control, principally around a few concession stands in the immediate fringe area. The refuse storage trucks were sprayed daily with a mixture of two percent Chlordane emulsion and a deodorant. This was a precautionary measure and its effect on the control of flies could not be evaluated. However, a fly problem did not develop around the refuse storage trucks or at the sanitary landfill.

The Pennsylvania State Department of Health, which cooperated closely with the Sanitation Staff, reported that mosquitoes were usually found in the Valley Forge Park area during the warm weather months. Therefore, the Jeep spray unit was used early in June to apply a residual of DDT to all potential breeding places, such as quarries with standing water, seepage areas fed by springs, and impoundments on small streams in the area. A residual of emulsifiable chlordane was applied to all seepage pits under showers, at water drawing stations, and other possible breeding places. Mosquito larvae were found only in two seepage areas and three small artificial ponds constructed for soil conservation exhibits. There was no adult mosquito problem during the period of the encampment.

A small amount of rodent control work was con-

FIGURE 9. CHEMICAL TOILETS AND TROUGH URINAL LATRINE

ducted against meadow mice and ground hogs in the Jamboree area. Warfarin bait, gas bombs and chlordane were used by the professional insect and rodent control crew. All burrow openings were carefully closed when gas bombs and chlordane were used. These measures were effective in controlling rodents.

REFUSE COLLECTION AND DISPOSAL

A new procedure was used in connection with the storage and collection of garbage and other refuse. Each scout Troop was provided with one metal refuse can and a supply of large wet-strength paper bags and twine. Immediately after each meal or when the bags became full, they were closed tightly with the twine, removed from the metal can and placed directly on the Section refuse truck. Sufficient one and one-half ton stake body Army trucks were provided so that a truck could be stationed continually around the Trading Posts and at each of the 38 Sections. Each time a truck load of refuse was removed, an empty was left by the driver. The bed of each truck was covered with a tarpaulin arranged so that a bulldozer could quickly unload it with a rope at the sanitary landfill. This refuse collection system and the sanitary landfill were operated in a highly satisfactory manner.

FRINGE AREA SANITATION

A program of sanitation within a three mile radius of Valley Forge Park was developed and carried out by the Pennsylvania State Department of Health. This program included the maintenance of strict sanitary control over public eating and drinking establishments, hotels and motels, refuse collection and disposal, and the sampling of water supplies available for public use in the area. Temporary food and drink

FIGURE 10. JEEP SPRAY UNIT IN OPERATION

FIGURE 11. STORAGE OF REFUSE IN TROOP SITES

stands were not allowed to operate until they complied with the State Itinerant Restaurant Regulations. State and local Police Departments cooperated fully with the sanitation inspection staff in controlling the operation of roadside stands.

SPECIAL SCOUT TOURS

In view of the heavy load on public transportation facilities, the arrival of scouts to the Jamboree was scheduled over a three-day period and the departure, likewise, over a three-day period. Special sightseeing trips were arranged for the scouts arriving early, and for those whose departure was delayed, to such points as New York City, Atlantic City, and Washington, D.C. The food establishments patronized on these trips were selected prior to the Jamboree and given close sanitary supervision by State and local health agencies during the period of the tours.

Special excursion trips were conducted during the official week of the Jamboree to historical points in the city of Philadelphia. From 7,000 to 10,000 scouts and leaders took this trip each day. They were transported from Valley Forge to Philadelphia by commuter trains and taken on a walking tour to such places as the Betsy Ross House, Old Custom House, Independence Hall, and then given a box lunch at Washington Square. The facilities provided by the city of Philadelphia for this 6-day feeding operation included picnic tables, drinking water, toilet and handwashing facilities, refuse collection and disposal facilities, fly control equipment, and a public address system for use in moving scout groups in and out of the area. Box lunches, including single-service containers of orange drink, were delivered to the scouts from refrigerated trucks operated by the box

lunch manufacturer.

SUMMARY

Careful planning, coordination of activities, and the excellent working relationships between the Jamboree Health and Safety Staff and other cooperating agencies contributed greatly to what was considered the most successful Jamboree ever held by the Boy Scouts of America. Perhaps the outstanding achievement resulting from the fine work of the Commissary and Supply Service Departments, together with the work of the Jamboree Sanitation Staff, and cooperating agencies, relates to the fact that those attending the Jamboree could be assured that the food and drink they received were not only nutritious and appetizing, but had been given close sanitary supervision from the time they were processed until consumed. Also by maintaining high sanitation standards, there was not a single case of foodborne disease or other disease which could be attributed to faulty environmental sanitation among the total of 995 scouts who received medical treatment at the camp hospital.

NEWS AND EVENTS

MINUTES OF THE AFFILIATE COUNCIL MEETING INTERNATIONAL ASSOCIATION OF MILK AND FOOD SANITARIANS, INC. ANNUAL MEETING, LOUISVILLE, KENTUCKY, OCTOBER 7, 1957

1. Harold S. Adams, Chairman, called the meeting to order at 3:00 P.M., October 7, 1957 in the Brown Hotel, Louisville, Kentucky. All persons present introduced themselves and named the Affiliate Association they represented. The Attendance is attached hereto as Appendix A.

2. Chairman Adams read the parts of the Constitution regarding the Council, its authorization and functions.

3. Secretary H. H. Wilkowske distributed copies and read the Minutes of the last meeting which were approved as read.

4.The Executive Secretary of the Association, H. L. Thomasson, read the proposed budget for the fiscal year ending July 15, 1958 which had previously been approved by the Executive Board. The Association budget was set at a total of $16,500.00 and the publication of the Journal at $23,873.00. Compared to estimated income this provided for a net balance in the neighborhood of two to three thousand dollars. The Chairman pointed out this was a conservative budget and very realistic.

5. Mr. Goslee asked whether the scholarship fund is due each year. This was answered in the affirmative and it was pointed out that International has established an annual scholarship fund in the amount of $300.00. This comes out of the contingency fund and is awarded to a successful undergraduate sanitary science student upon recommendation of the Scholarship Committee. Final decision is left to the Executive Board. Affiliates are asked to contribute annually in such amounts as they see fit. The original suggestion was that they contribute at the rate of twenty-five cents per member per year. When monies so contributed amount to $300.00, two scholarships in a given year may be awarded. The contribution from affiliates is requested on a continuing annual basis.

6. Regarding income of the Association it was pointed out that the $3.00 dues goes to the operation of the Association and none to support the Journal. The Journal pays its own way and actually supplements the Association income. Upon motion by Mr. Goslee and seconded by Mr. Parry the report of the budget was approved.

7. Mr. P. E. Riley reported for the special constitution revision committee of the Council. The committee recommended several changes in the Constitution and By-Laws. The report of the committee is attached hereto as Appendix B. After considerable discussion concerning the report, upon motion by J. J. Sheuring, and seconded by Karl Jones, the report was accepted. (Note: It should be pointed out that these recommendations as well as others brought out at the annual business meeting of the Association will all be handled simultaneously by a special committee of the Executive Board and submitted to the membership for vote in accordance with the procedures prescribed in the Constitution and By-Laws).

8. Karl Jones reported for the Committee on Committees, its function being to study the committee distribution in the various affiliate Associations for the purpose of improved liaison between the same committees in the various states. The Committee had nothing further to report this year. It was agreed that the new Chairman Paul Corash should decide whether this committee should be continued and whether new appointments should be made.

9. Ivan Parkin reported for the 3-A Executive Committee and suggested more assistance from Affiliate Associations by extending an invitation to them to make their desires known to the members of the 3-A Sanitary Standards Committee.

10. John J. Sheuring reported for the Steering Committee. He pointed out that for the past three years it has operated on the basis of establishing an agenda and that the items are suggested only for discussion and not necessarily as an endorsement by the Steering Committee. The several items are recorded below.

11. Renaming the Association. After discussion it was agreed the reason was to broaden the scope of the Association to include those working in the field of General Sanitation. There was general, but not unanimous agreement in this matter. Thereupon the Council voted to reject the suggested change in the name of the Association upon motion of P. E. Riley and second by Ellis Rackleff.

12. Increasing undergraduate scholarship benefits. The Council heard a report concerning the Affiliate Association support of the scholarship plan. Only seven states have supported this plan and apparently not on a continuing basis. About the only way it can operate effectively is through continous support. Some other State Associations have their own plans which are operated independently of the International Association. After discussion it appeared evident that the entire scholarship plan needs strengthening and a complete over-haul may be in order. This includes increased support by the States, increased publicity and amount and increased interest in applicants. While no formal action was taken it would appear this would be a task for the Association Committee on Education and Professional Development.

13. A discussion of the status of Registration of Sanitarians was omitted since there was a formal paper on this subject scheduled for the main meeting.

14. It was pointed out the national office is always ready to help in recruiting local members.

15. There was an item on the agenda concerning improving the Awards Program which was passed over due to shortage of time.

16. Dr. J. C. Olson, Jr., Associate Editor of the Journal pointed out how the number and quality of papers has improved during the past year. He urged all Secretaries of Affiliate Associations to send programs of their respective Annual Meetings. This year only eight were received as compared to fifteen last year. Secretaries also should encourage program speakers to send in good papers to the Journal for consideration.

17. The meeting adjourned at 5:15 P.M.

H. H. Wilkowske, Secretary of the Council

APPENDIX A (ATTENDANCE)

NAME	*AFFILIATE ASSOCIATION*
Robert P. Hayward	South Dakota
John E. Fields	North Dakota

Alfred B. Johnsgard	North Dakota
Frank L. Kelley	Kansas
Dean D. Duke	Kansas
P. Edward Riley	Illinois
Karl K. Jones	Indiana
John Sheuring	Georgia
Richard M. Parry	Rhode Island
H. Clifford Goslee	Connecticut
Ellis Rackleff	Oregon
Paul Corash	IAMFS Executive Board
Franklin W. Barber	IAMFS Executive Board
I. E. Parkin	IAMFS Executive Board & Penn.
Richard P. March	New York
W. Lawton	Minnesota
C. G. Leonard	South Carolina
William V. Hickey	IAMFS Executive Board
Harold Barnum	Rocky Mountain
Red Thomasson	IAMFS - Shelbyville
Alan B. Miller	Pennsylvania
Harold B. Robinson	IAMFS Executive Board
J. C. Olson, Jr.	Journal Assoc. Editor
H. H. Wilkowske	Secretary

APPENDIX B

REPORT OF THE CONSTITUTION REVISION COMMITTEE

At the last meeting of the Council held in conjunction with the Annual Business Meeting of the Association in Seattle, on September 4, 1956, the Council adopted the following motion: "The Chairman of the Council (shall) appoint a committee to study the Constitution and By-Laws to determine whether improvements and changes should be made, and report at the next annual meeting."

In carrying out this study, the committee wrote to the secretary of each of the 27 affiliates, advising them of the task assigned to the committee and requesting a personal commentary and to recommend any changes of the powers and duties of the Council and the manner in which the Council Chairman should be selected. Two of the replies recommended no change be made; one recommended that the Council be empowered to select its own chairmen, and one recommended that the Council be disbanded. Replies from the other secretaries were inconclusive. The committee, after studying the question, recommends that no changes be made in the Purpose and Duties of the Council; that it continue to be solely an advisory body to the Executive Board, as is specified in Article II, Section 6, of the By-Laws.

The committee has concluded that the Council, as a whole, would prefer to appoint its own chairman and secretary, rather than to have the immediate Past-President and Secretary-Treasurer of the Association serve, as is now specified in Article-IV, Section 3 of the Constitution. There appears to be little need to include in the Council membership five officers from the Executive Board. Representation of the Executive Board might well be limited to the immediate two Past Presidents of the Association. Further, designation by the affiliates of persons other than secretaries should be clarified. It, therefore, proposes that a complete revision of Article IV, Section 3, of the Constitution be made and recommends the following:

> "The Council shall consist of the Secretary or other authorized delegate from each Affiliate Association, and the immediate two Past Presidents of the Association. Each Affiliate Association shall have one vote at Council meeting. The Council shall select its chairman and secretary, shall keep a record of its proceedings, and shall, at each annual meeting of the Association, submit its recommendations to the Executive Board".

If the above revision is adopted, the committee recommends that Article V, Section 2, of the Constitution also be amended. The second sentence of this section should be changed to read, "The representative shall be the Secretary or other authorized delegate of the Affiliate Association." The last sentence of this section should then be deleted. The amended section will then read:

> "Each Affiliate Association shall have one representative on the Council. The representative shall be the Secretary or other authorized delegate of the Affiliate Association.

It is the opinion of the committee that there are a number of additional changes in the By-Laws that should be made.

The following are recommended by this committee:

(a) *Article II, Section 4, Subitems D and E*
The word "He" which appears as the first word in each of these subitems should be deleted and the the words "The Secretary-Treasurer" substituted therefor. Also, the words "and the Council" should be deleted and the word "and" inserted between the words "Association" and "Executive Board" in the first line of subitem E.

(b) *Article II, Section 6, Subitem F*
If the recommended revision of Article IV, Section 3, of the Constitution is adopted, this subitem should be changed by replacing the words "Immediate Past-President" with the word "Chairman".

(c) *Article III, Section 5*
This entire section is a repetition of Article 5, Section 2, of the Constitution. It should be deleted.

(d) *Article IV, Section 1, Subitem A*
The words, "who shall serve as" should be inserted between the words "President-Elect" and "Chairman."

(e) *Article IV, Section 1, Subitem B*
It is proposed that this subitem be revised to read "The Membership Committee shall consist of a Chairman to be appointed by the President, the Secretary-Treasurer, one member from each Affiliate, and such other members as are deemed desirable by the Executive Board."

(f) *Article IV, Section 1, Subitem C*
The word "Publications" should be substituted for the word "Publication", and the word, "shall" should be substituted for the word "will" in the first line. In the second line, the word "to" should be substituted for the word "of" following the word "publications". The word "appertaining" in this line should be changed to "pertaining". Also, in the fourth line, the words "and business" should be deleted since the Committee on Publications no longer handles business matters concerned with publication of the Journal.

(g) *Article VI, Section 2*
The second and fourth sentences in this section are similar to the material included in Article 4, Section 1, Subitem C, of the By-Laws, and should be deleted from one of the two sections.

P. Edward Riley, *Chairman* John D. Faulkner
Harold J. Barnum Alan B. Miller

ANNOUNCEMENTS

For the coming year Chairman Paul Corash announces the appointment to the Council Steering Committee two new members for three years terms and the year to expire as follows: Karl Jones (1960) Richard Parry (1960)

Other members of the Steering Committee are Chairman J. H. McCutcheson, Missouri, (1958), J. F. Quinn, Wyoming (1958), George Steele, Minnesota (1959), and Frank Kelly, Kansas, (1959)

Chairman Corash has also asked the Committee on Committees to function for another year with the same membership consisting of Chairman C. W. Weber, Karl Jones and H. L. Thomasson.

PROFESSOR JOHN O. BARKMAN RETIRES

After thirty-eight years service at the University of Kentucky and for the dairy industry of his state, Professor John O. Barkman recently retired from academic duties following his 70th birthday. Friends, co-workers and members of the dairy industry tendered him a testimonial breakfast followed by the dedication of the remodeled University Dairy Products Plants to be known as the Barkman Dairy Products Laboratory.

State Commissioner of Agriculture, Ben Butler, in the name of Governor Chandler, commissioned Professor Barkman a, "Kentucky Colonel".

While Professor Barkman is now on a "change of work status" he will continue active in consulting work with the dairy industry and will supervise scholarships in Dairy Manufacturing. In the latter capacity he has had wide experience since he has encouraged and given assistance personally to a large number of students during his University career.

During his long tenure at the University he was instrumental in the founding of the Central Kentucky Manufactured Milk Improvement Association, as well as the Cream Improvement Association. The Kentucky Dairy Industry is in his debt for the many years of wise counsel and dedicated service given toward improvement of the State's dairy industry.

COOPERATION OF AFFILIATES WITH 3A SANITARY STANDARDS COMMITTEE EMPHASIZED

The manifold problems of the 3A Sanitary Standards Committee and the Symbol which is placed on dairy equipment meeting 3A Standards involve greater use of personnel in the dairy field. To bring into sharper focus the problems of cooperation among the many sanitarians in the field and the relatively few who serve as members of the 3A group is a matter needing attention and emphasis.

The 3A group assumes the responsibility of studying equipment needs and promulgating standards that will help insure the highest level of sanitation and product protection. Committee work is exacting, time consuming and technical in nature. When standards are finally agreed upon the manufacturer. user and regulatory officals should find them practical, useful, and above all, a guide to uniform and desirable fabrication specifications.

Up to the present, fifteen standards have been promulgated, approved and published; ten amendments have been added and currently there are about ten to fifteen standards that are in various phases of development. Overall these standards have not been utilized to the degree that is desirable.

The three groups represented in the 3A program, namely, the dairy industry, IAMFS and the U.S. Public Health Service realize that the true value of this work, culminating with standards, accrues when milk and dairy sanitarians utilize them in their field inspections and investigations. If the 3A program is to become more successful, greater cooperation is asked from the membership of our Association. This cooperation can be demonstrated in a number of ways. It is more than possible that sanitarians and regulatory people may see some features of equipment that may be overlooked by the Committee. When this is true, a letter to anyone of the several committee members would be highly desirable. Sanitarians should suggest items of equipment they feel merit close study. They should suggest the need for changes or amendments to existing 3A standards and report infractions noted in dairy equipment for which there is a standard or upon which the 3A symbol may be affixed.

The goal of the 3A Committee is to have standards accepted universally. Standardization means that manufacturers can make better equipment and mass produce it more economically.

At this point in the committee's program there is no mechanism for spot checking specifications of equipment carrying the 3A symbol. This is where the cooperation of our membership is needed and solicited. The work of this important committee will be greatly enhanced if members of our Association become more interested and helpful in this project.

In all matters involving 3A standards and the 3A symbol, or when violations are noted, a communication should be sent to your nearest 3A committee member or to S. H. Williams, 3A Sanitary Standards Committee, Dairy Industry Supply Association, 1145 19th St. N.W. Washington, D.C.

3A Committee for IAMFS Ivan E. Parkin, Member

AUTHORIZATIONS TO USE THE 3-A SYMBOL

Following is a list of concerns to which 3-A Symbol Council authorizations to use the 3-A symbol have been issued since publication of the list in the September number of the Journal. Those identified thus (*) are recipients of newly-issued authorizations. The other concerns listed have had their authorization certificates amended because of change of firm name, change of address, or addition of model numbers.

AUTHORIZATION NUMBER	CONCERN AND ADDRESS	MODEL NUMBERS
	ELECTRIC MOTORS	
77	*Electra Motors, Inc. 1110 North Lemon Street, Anaheim, California	List of 52 model numbers on file.
	FITTINGS, SANITARY	
79	*Alloy Products Corporation 1045 Perkins Avenue, Waukesha, Wisconsin	Types shown in reprints of the Sanitary Standards, and Supplement No. 2.
82	*Cherry-Burrell Corporation 501 Albany Street, Little Falls, New York	List of 101 model numbers on file.
78	*L. C. Thomsen & Sons, Inc. 1303 - 43rd Street, Kenosha, Wisconsin	10 CL and 10 FL.
86	*Waukesha Specialty Company Walworth, Wisconsin	10 CLR and 10 F.
	HEAT EXCHANGERS, PLATE TYPE	
46	A.P.V. (Canada) Equipment, Ltd. Address changed to: 56 Charles Street, Newmarket, Ontario	No change in model numbers.
	HOMOGENIZERS AND HIGH-PRESSURE PLUNGER-TYPE PUMPS	
87	*Cherry-Burrell Corporation 2400 Sixth Street, S.W., Cedar Rapids, Iowa	Stellar: 200, 300, 400, 500, 700, 800, 1000, 1500, 2500, 3000, and 5000. Stellar–Flo: 400, 800, 1200, and 2500.
75	*Manton-Gaulin Mfg. Co., Inc. 44 Garden Street, Everett 49, Massachuseets	DJ-3, DJ-7, DJ-10, DJ-12, DJ-20, DJ-30, DJ-40, and DJ-50.
	TANKS, FARM HOLDING AND/OR COOLING	
19	Brown Equipment Company Coalville, Utah	Add: B-450, B-1250, B-2500, and B-3000.
81	*Clarkson & Clark, Inc. 1936 North "A" Street, Wellington, Kansas	R:150, 200, 250, 300, 400, 500, 600, 700, 800, 1000, 1250, and 1500. S:150, 200, 250, 300, and 400.

11	Creamery Package Mfg. Co. 1243 W. Washington Blvd., Chicago 7, Ill.	Add: VA-375
92	*The DeLaval Company, Ltd. Peterborough, Ontario	180, 250, 300, and 375.
22	Groen Manufacturing Co. 4535 W. Armitage Avenue, Chicago 39, Illinois	Add: RWL:100, 125, 150, 170, 205, 230, and 275 gal. RWL3:100, 125, 150, 170, 205, 230, and 275 gal.
48	Miller Metal Division, Miller and Gay, Contractors, 457 S. Washington St., Wichita, Kan. Changed to: Miller Products, Inc. 222 Dewey Street, Wichita, Kan.	
41	Mojonnier Bros. Co. 4601 W. Ohio Street, Chicago 44, Illinois	Add: 1000-V.
12	Paul Mueller Company Kansas at Phelps Street, Springfield, Missouri	Add: "M" and "MS".
6	Solar-Permanent Company Tomahawk, Wisconsin	Add: 7-1000, 8-1000, and 10-1000.
24	Wilson Refrigeration, Inc. Smyrna, Del.	Changed to: WB:100, 150, 200, 250, 300, 375, 500, 600, and 700.

TANKS, STORAGE

84	*Alloy Products Corporation 1045 Perkins Avenue, Waukesha, Wisconsin	Non-Refrigerated: Cylindrical, Space-Saver, and rectangular. Refrigerated: PR and BH; cyl., Space-Saver, and rect.
90	*A. H. Arnold Company 2501 No. Wayne Avenue, Chicago 14, Illinois	Model numbers not used.
83	*Metal-Glass Products Company Belding, Michigan	FL, FM, and FS.
88	*Steel and Tube Products Co. 200 W. Olive Street, Milwaukee 12, Wisconsin	Standard: hor. or vert. Cold Wall: hor. or vert. Econo: Standard or Cold wall.

TANKS, AUTOMOTIVE TRANSPORT OR PICK-UP

91	*A. H. Arnold Company 2501 No. Wayne Avenue, Chicago 14, Illinois	Model numbers not used.
76	*Damrow Brothers Company 196 Western Avenue, Fond du Lac, Wisconsin	E, ER, O, OF, P, R, RP, RR, S, SC, SP, and SR.
85	*Polar Manufacturing Company Holdingford, Minnesota	BP-1500 and BP-1700.
80	*C. Richardson & Co., Ltd. Wellington St., South, St. Mary's, Ontario	R-S-1-2: 10, 12, 14, 15, 16, 18, 20, 24, and 30.

FOOD AND BEVERAGE VENDING MACHINES UNDERGOING EVALUATION

Two agencies have been designated by the National Automatic Merchandising Association for the evaluation of coin operated food and beverage vending machines. These agencies are the Indiana University Research Foundation, Indianapolis, and facilities of the Department of Bacteriology and Public Health at Michigan State University at East Lansing.

Working through the NAMA, machine manufacturers ship production models of food and beverage vending equipment to either of the evaluating agencies. A detailed check list has been prepared in collaboration with the Health Industry Committee which serves in an advisory capacity to NAMA. This list is closely followed when examinations are made. Each machine is evaluated on the basis of provisions contained in, *The Vending of Foods and Beverages, A Sanitation Ordinance and Code, 1957 Recommendations of the Public Health Service.*

At the conclusion of the evaluation, manufacturers are advised of any changes in construction or design that may be necessary for compliance. Particular attention is given to construction details, accessibility and ease of cleaning, adequate refrigeration capacity, and controls if perishable foods or beverages are vended, and use of product contact surface which are smooth, readily cleanable and non toxic. In the case of perishable foods, the vending equipment is tested at an ambient temperature of 110°F to ascertain whether refrigeration is adequate to maintain the product storage compartment at 50°F or below.

When equipment has been found to be in compliance, a compliance letter is furnished the manufacturer by the evaluating agency. This does not constitute a seal of approval, but does indicate that a given machine is in compliance with the sanitary and public health provisions of the aforementioned, Ordinance and Code.

The evaluation program is designed to be of assistance to manufacturers, operators and regulatory agencies. In addition, the Armed Forces have an interest in the operation of food and beverage vending machines since they are currently in use at many Armed Forces installations.

In connection with use by the Armed Forces, the Surgeons General of the Army, Navy, and Air Force have issued the following tri-service policy which reads in part as follows:

The proponent will be required to furnish the following documentary information for inclusion with the military user's request for evaluation:

a. a complete description of the product including information on its application, method of operation, the environmental conditions under which it is designed to function, and where applicable, chemical formulas and toxicological data.
b. a statement describing the extent of civilian usage, including the full extent to which the product has been approved or accepted by local, state, or federal health authorities. Included should be a statement as to whether or not any agency of the Federal Government has tested or evaluated the device or process, identifying the agency.
c. a fully detailed report on an appropriate investigation conducted by an impartial agency or individual of recognized standing which is designed to provide evidence that the product fulfills its intended function under conditions corresponding to those in which the military service may expect to employ it. The report should include information describing the tests performed, the results thereof, the names, positions, and statements of the investigators attesting conclusive proof of the acceptability of the product for the intended purpose, and identifying the standards which were used as a basis for the testing reported.

In the case of automatic coin-operated vending machines, the following policy has been adopted:

a. that newly developed vending equipment shall comply with applicable military regulations as well as the provisions of the, "Public Health Service Sanitation Ordinance and Code Covering the Vending of Foods and Beverages 1957," before installation. A statement from a recognized testing agency that such equipment complies with the PHS Ordinance will ordinarily suffice.
b. that models now in use on military installations shall be tested and approved as above on or before 1 July 1958.

The automatic merchandising industry is cooperating wholeheartedly with the public health program. As new models are designed, manufacturers are observing carefully the provisions contained in the 1957 PHS Ordinance.

At Michigan State University, Drs. W. L. Mallman and Frank Peabody are in charge of the evaluating and testing program while at Indiana University, Dr. S. H. Hopper and H. S. Adams are conducting the evaluation work.

QUESTIONS AND ANSWERS

Editorial Note: Various question of technical nature may be submitted to the Editorial Office of the Journal. They will be referred to a Committee which has been formed to provide answers to such questions. A question in your mind may be in the minds of many others. Send your questions in and we shall attempt to answer them.

Question: Regarding the ascorbic acid content of foods, what are the effects of freezing, of sunshine, and kind of soil?

Captain Tauft K. Holton
U.S. Naval Submarine Base
San Francisco, California

Answer: Commerical freezing processes do not cause any loss in ascorbic acid. If the food should warm up to 15° to 20°F there is loss of color, flavor and ascorbic acid. Plants receiving the most sunshine generally have the highest ascorbic acid content. Figures are not available comparing ascorbic acid of plants grown in tropical climates with those grown in temperate climates. Soils containing minerals such as manganese and molybdenum can effect ascorbic acid content. Usually this is not an important factor. (Note: Letter sent to inquirer was returned. Request he send new address to Journal).

Question: What is the latest information regarding antibiotics in milk?

W. A. Penn, Director
Municipal Laboratory
Savannah, Georgia

Answer: From time to time the suggestion has been advanced that a suitable dye be incorporated into antibiotic preparations for use in mastitis therapy. This would have to be nontoxic, and of high tinctorial power so that its presence could be readily detected in milk containing as little as O.1 unit of penicillin per ml. of milk. Earlier in 1957 the Food and Drug Administration considered proposal, as well as one that treatment with antibiotics should be available only on prescription of or by a licensed veterinarian. It was pointed out that no suitable dye had yet been found, while the veterinarian requirement would impose a hardship where veterinarians were scarce. Consequently, both proposals were rejected and, instead, a limit of 100,000 units penicillin per dose was set as of August 12, 1957. The F. D. A. hopes this will reduce the amount of penicillin finding its way into milk.

3-A STANDARDS FOR MILKING MACHINES, PUMP AMENDMENT NEAR COMPLETION

A total of eight proposed 3-A Sanitary Standards for dairy equipment and an amendment of an existing 3-A Sanitary Standard were on the agenda at the regular semi-annual meeting of the 3-A Sanitary Standards Committees, December 2-4, 1957, at the Kellogg Center, Michigan State University, East Lansing, Michigan.

Conferees reported near-final agreement on one of the eight proposed standards and on an amendment to an existing 3-A Sanitary Standard. These two will probably be published as official 3-A Sanitary Standards before the next regular meeting of the 3-A groups in the spring. The two in question are, (1) the tentative 3-A Sanitary Standard on Milking Machines and (2) an amendment to the existing 3-A Sanitary Standards for Pumps for Milk and Milk products.

Also considered were standards for or amendments to existing standards for the following seven items: (1) ice cream freezers; (2) automatic bulk fluid milk vending machines; (3) rubber and rubber-like materials; (4) farm holding tanks; (5) methods and equipment for supplying air under pressure in milk processing; (6) plastics materials; and (7) cleaned-in-place pipelines for farms.

More than 115 technical personnel from all parts of the United States attended the semi-annual sessions which were being held for the first time at the Kellogg Center. The 3-A Sanitary Standards Committees are comprised of representatives from (1) sanitarians and regulatory officials, represented by the Committee on Sanitary Procedures of International Association of Milk and Food Sanitarians; (2) personnel from the U.S. Public Health Service's Milk and Food Program; (3) dairy processors and dairy supply and equipment manufacturers, represented by the Sanitary Standards Subcommittee of the Dairy Industry Committee.

Joint hosts to the standards groups were MSU's Agricultural Engineering Department, represented by Dr. A. W. Farrell, and the Dairy Department, represented by Dr. N. P. Ralston. On two occasions participants in the meetings were given conducted tours of both departments.

Two speakers on regulatory problems within the dairy industry were heard at two informal luncheons held during the sessions. They were George McIntyre, Director of the Michigan Department of

Agriculture. Dr. John D. Ryder, Dean of the College of Engineering, also addressed the meeting.

SANITATION ACHIEVEMENT AT BOY SCOUT JAMBOREE

Elsewhere in this issue is a report on the sanitation program at the Fourth National Boy Scout Jamboree which was held at Valley Forge Park, Pennsylvania, July 12-18, 1957. This excellent report by Archie B. Freeman should be of interest to all sanitarians. The lack of food and water borne illness and the effective environmental sanitation program, which prevailed throughout the Jamboree, was a major accomplishment. The success of this aspect of the Jamboree is a tribute to the organization and to the efforts and leadership of sanitarians.

Mr. Freeman's report should be of vital interest to Scout Troop Leaders and Scout Committeemen. Readers of this article will render a service by calling the attention of such individuals to this valuable report.

JOINT DAIRY CONFERENCE AT UNIVERSITY OF WISCONSIN

February 5-7 witnessed the annual University of Wisconsin Dairy Manufacturer's Conference and that of the Wisconsin Dairy Plant Fieldmen. The program highlighted future developments in dairy products. A number of important subjects were considered including packaging and packaging materials, quality control, ultra high temperature pasteurization of milk, effecient hook-ups for CIP, bulk handling of sugar in frozen desserts manufacture and grade A standards for cottage cheese.

The Dairy Plant Fieldmen's Conference considered such subjects as, the problems of staphlococci in milk, antibiotics in dairy products, adapting milk houses for bulk tanks, and fly control measures.

During the conference a joint meeting was arranged with the Wisconsin Dairy Technology Society, at which time Dr. William Stone of the University was principal speaker.

Dr. K. G. Weckel, Department of Dairy and Food Industries, served as program chairman.

ANNOUNCEMENT

University of North Carolina announces Doctoral Program in the Department of Sanitary Engineering of the School of Public Health. Candidates for the doctorate must have completed a master's degree in sanitary engineering, sanitary science, or sanitary chemistry and biology at the University of North Carolina or have completed an equivalent program at another institution.

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HELPFUL INFORMATION

Editorial Note: Listed below are sources of information on a variety of subjects. Requests for any of the material listed should be sent by letter or postcard to the source indicated.

Radiological Health Book. A guide to radiation safety. 356 pages. Available from U.S. Dept. of Health, Education, and Welfare, Washington, D.C. Price $3.75.

Defense Guides for Commercial Food Facilities. Agric. Information Bulletin No. 169. Available from Food and Materials Requirements Division, Commodity Stabilization Service, U.S. Dept. of Agric., Washington, D.C. No charge.

The Freezing Preservation of Foods Books. Vol. 1 Freezing of Fresh Foods. Price $10.00; Vol 2 Freezing of Precooked and Prepared Foods, Price $10.00. Available from AVI Publishing Co., 7 Taylor Place, Westport, Conn.

Brewers Sanitation Guide. Bulletin No. S8021 R3. Available from Oakite Products Co., New York, N.Y. No charge.

Bakery Rodent Controls. Bulletin No. 150. Available from American Society of Bakery Engineers, 1354 La-Salle Wacker Bldg., 121 W. Wacker Dr., Chicago, Ill.

Guide for Cleaning in Food Canning and Preserving Plants. Bulletin. Available from Oakite Products Co., 27 Rector St., New York 6, N.Y. No charge.

Federal Milk Market Orders. Their Establishment, Terms and Operation. Buillletin. Misc. Publication No. 732. U.S. Dept. of Agric. Available from Supt. of Documents, Washington, D.C. Price 25 cents.

Off-Peak Operation of Bulk Milk Cooler of the Ice Bank Type. Bulletin. Available from Dept. of Agric. Engineering, University of Wisconsin, Madison, Wisc. No charge.

Comparing Bulk and Can Milk Hauling Costs. Circular 14. June 1956. Available from U.S. Dept. of Agric., Washington, D.C. No charge.

Farm Output. Put Changes and Projected Needs. U. S. D. A. A. R. S. Agric. Information Bulletin No. 162. Available from Supt. of Documents, Washington, D.C. Price 25 cents.

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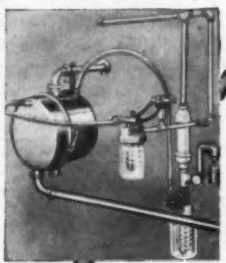

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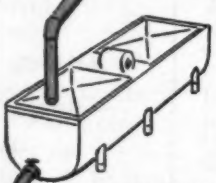

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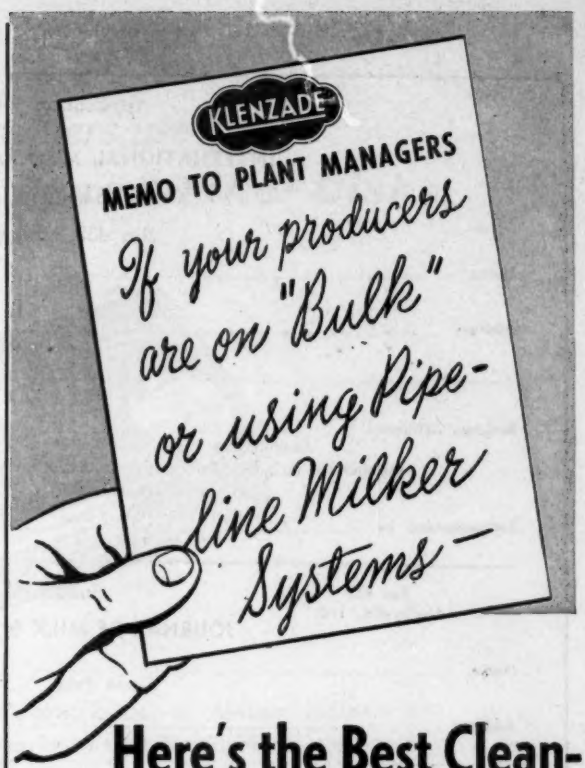

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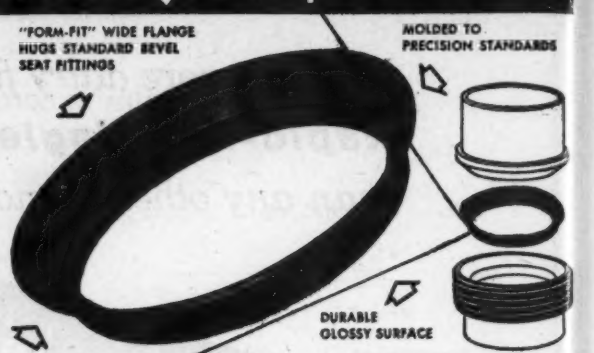
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